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**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

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**SEP 23 1998**

**FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY**

In the Matter of )

1998 Biennial Regulatory Review -- )  
Conducted Emissions Limits Below 30 MHz )  
for Equipment Regulated Under Parts 15 )  
and 18 of the Commission's Rules )

ET Docket No. 98-80

**REPLY COMMENTS OF THE  
NATIONAL ASSOCIATION OF BROADCASTERS**

**I. INTRODUCTION AND SUMMARY**

In the *Notice of Inquiry*<sup>1</sup> in the above-captioned proceeding, the Commission asks whether it should retain, modify or eliminate FCC regulations aimed at restricting "conducted emissions" from various devices that direct RF signals onto AC power lines. Found in Parts 15 and 18 of the FCC's rules, these regulations address emissions from a variety of electric and electronic devices. These devices include "intentional" radiators, the function of which is dependent on such emissions, and "unintentional" or "incidental" radiators that emit RF signals as a byproduct of the device's primary function.

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<sup>1</sup> *Notice of Inquiry* in ET Docket No. 98-80 ("*Notice*"), \_\_\_ FCC Rcd \_\_\_ (1998).

The National Association of Broadcasters (“NAB”),<sup>2</sup> in its initial comments, argued that any lessening of the Commission’s conducted emission limits would seriously threaten the AM broadcast service.<sup>3</sup> Indeed, we pointed out that the FCC’s existing conducted emission limits may not be strict enough to achieve this goal of interference protection to the AM broadcast band.

For purposes of our initial comments, NAB commissioned a study to determine the impact of AC power line conducted emissions on modern AM broadcast receivers. The results of this study demonstrate that the Part 15 and Part 18 conducted emissions limits should be tightened to provide adequate protection to the AM broadcasting service.

Today NAB responds to certain parties filing initial comments that do not reflect NAB’s level of concern over interference to the AM broadcast band. We also reply to a party who has proposed revised emissions limits and a revised methodology for measuring conducted interference.

## **II AM BROADCASTING REQUIRES AS MUCH INTERFERENCE PROTECTION AS DO ALL OTHER LICENSED COMMUNICATIONS SERVICES**

In its comments Interactive Technologies, Inc. (“ITI”) says that

“...the Commission’s emissions policies should reflect the growth and potential of new radio technologies, including satellite (DARS), cable, and the Internet, in addition to standard FM broadcasting, which offer other options for broadcast reception. All these technologies reduce the need for continued strict conducted emissions limits on carrier current devices to protect AM communications.”<sup>4</sup>

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<sup>2</sup> NAB is a nonprofit, incorporated association of television and radio stations and broadcast networks that serves and represents the American broadcast industry.

<sup>3</sup> Comments of NAB, filed September 8, 1998.

<sup>4</sup> Comments of Interactive Technologies, Inc., filed September 8, 1998, at 7.

In effect, ITI is asking the Commission, and all Americans, to abandon the AM broadcasting service.

NAB strongly objects to ITI's misguided and blatantly self-serving proposal. There are 4,733 AM radio stations operating in the United States,<sup>5</sup> with millions and millions of Americans listening to them. In most communities it is these AM stations that provide the most comprehensive local news and information programming on the radio. ITI would deny all Americans access to this service so that it may market devices that pollute the AM broadcast band. This would clearly be contrary to the public interest and to the most fundamental notions of rational communications policy.

Security alarm technology does not require operation in the AM band. AM broadcast *must* use AM frequencies in order to operate. ITI has a choice: It may either operate within responsible RF emission limits or adopt another technology for the functioning of its products -- a technology that does not use the AM broadcast band. The Commission must reject ITI's proposal.

### **III. INTERMITTENT EMISSIONS THAT EXCEED THE "BASIC" PART 15 AND PART 18 LIMITS SHOULD NOT BE PERMITTED IN THE AM BROADCAST BAND.**

ITI also requests that the Commission permit intermittent emissions in the AM broadcast band.<sup>6</sup> NAB strongly opposes *any* relaxation of the Part 15 and Part 18 conducted emission limits that apply in the AM broadcast band. As we discussed in our comments, the AM band conducted emission limits need to be *more* restrictive in order to provide adequate protection to

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<sup>5</sup> FCC News Release No. 85488, "Broadcast Station Totals as of August 31, 1998," September 11, 1998.

<sup>6</sup> Comments of Interactive Technologies, Inc., *supra*, at 2.

AM radio. Intermittent transmissions can cause serious interference to AM reception, particularly when emissions from multiple systems are present in the same area.

#### **IV. THE PART 15 AND PART 18 CONDUCTED EMISSION LIMITS IN THE AM BROADCAST BAND MUST BE TIGHTENED**

In its comments, the Information Technology Industry Council ("ITIC") argues that "the existing conducted emission limits in both the United States and in the European Union countries have resulted in an interference-free situation."<sup>7</sup> However, ITIC provides no evidence to support this claim.

Indeed, ITIC's assertion is incorrect. The technical data supplied with our initial comments in this proceeding clearly refute the claim that the existing limits provide adequate interference protection to AM radio.<sup>8</sup>

#### **V. THE COMMISSION'S CONDUCTED AND RADIATED EMISSION LIMITS MUST APPLY TO ALL DEVICES IN ORDER TO BE EFFECTIVE.**

In its comments, Inline Connection Corporation ("Inline") argues that "there is no rationale for treating either Inline's [VCR signal distribution system] or LAN equipment, neither of which utilize electric power lines, as carrier current devices subject to radiated emissions limits below 30 MHz."<sup>9</sup> In reality, however, there *is* a rationale for subjecting LAN equipment, Inline's system and other devices connected by any form of cabling to radiated emission limits below 30 MHz. This rationale is that *these systems cause interference to AM radio*.

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<sup>7</sup> Comments of the Information Technology Industry Council, filed July 27, 1998, at 2.

<sup>8</sup> Comments of NAB, filed September 8, 1998, at Appendix A.

<sup>9</sup> Comments of Inline Connection Corporation, filed July 27, 1998, at 4.

Inline argues that the AC power line conducted emission limits that apply to its system are sufficient to protect AM radio receivers from interference, and that there should therefore be no limit on the level of energy that may be radiated from the non-AC power line cabling that connects the components of its system. It says that similar logic can be applied to LAN equipment. To support this argument, Inline points to a “lack of interference complaints from the tens of thousands of LAN cards on the market.”<sup>10</sup>

A minimal number of consumer complaints constitutes woefully inadequate evidence upon which to base any conclusion that LAN equipment and other systems -- such as Inline's -- do not cause interference. With regard to the AM broadcast band in particular, it is very uncommon for a listener to complain to a manufacturer when interference occurs. Because there are natural phenomena that produce interference to AM radio (*e.g.* lightning), and some common unnatural phenomena (*e.g.* electric power lines and electric motors), AM radio listeners have, unfortunately, become very accustomed to hearing periodic interference. For example, many such listeners simply attribute the interference they hear from LAN equipment to the same phenomenon that causes interference when they pass under a high voltage power line while listening to a car radio. As a result, they accept it as a “fact of life.”

A 1988 study prepared by B. Angell & Associates, Inc. for NAB confirmed that the most common listener response to AM radio interference is to change stations. This study reported that, when interference problems are experienced, 57% of listeners react by simply changing stations.<sup>11</sup> Although this study did not determine the types of stations these listeners switched to (*i.e.* AM or FM), it seems safe to assume that many listeners who experience interference while

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<sup>10</sup> *Id.* at 5.

<sup>11</sup> B. Angell & Associates, Inc., *AM Radio Interference Study, Final Report*, June, 1988, at 27.

listening to AM radio will switch to an FM station. In this respect, interference caused by LAN equipment is particularly harmful to the AM broadcasting service.

The proliferation of consumer electronic equipment and electrical appliances which cause interference to AM radio has had a very negative impact on the AM service. The percentage of radio listeners who listen to AM radio has decreased by over 50 percent in the past 15 years.<sup>12</sup> One of the significant reasons for this decline has been increased interference to AM receivers. The Commission must stem the tide of RF pollution that is poisoning the AM broadcast band by rejecting any proposals, like the ones in this proceeding, that would increase the amount of noise in the AM band.

#### **VI. THE EMC COMPLIANCE TESTS CONFIRM THAT A TIGHTENING OF THE CONDUCTED EMISSIONS LIMITS IS NECESSARY TO PROTECT AM RADIO RECEIVERS**

In its comments EMC Compliance provides results from tests that it performed to determine the susceptibility of AM receivers to AC power line conducted emissions.<sup>13</sup> EMC Compliance indicates that it tested 33 receivers, although it does not indicate whether these receivers are of recent manufacture.<sup>14</sup> Each receiver was tested for three types of power line conducted interference: common mode injection into two 50  $\mu$ H line impedance stabilization networks (LISNs), differential mode injection into two 50  $\mu$ H LISNs and line-to-ground injection into a single 5  $\mu$ H LISN.

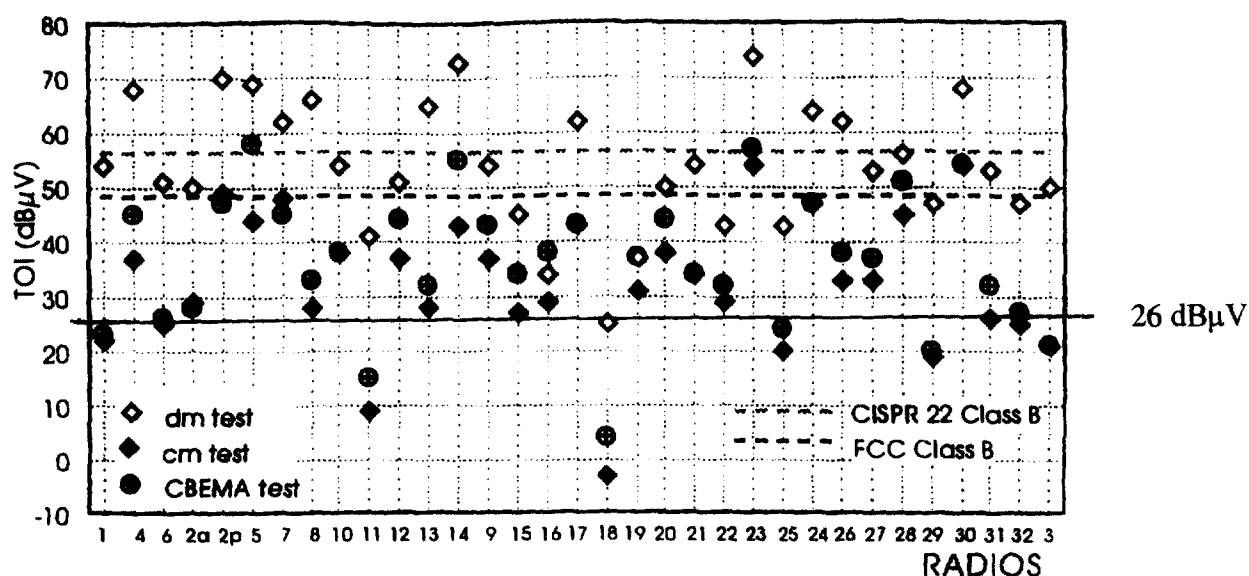
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<sup>12</sup> BIA Research, Inc., *State of the Radio Industry 1998*, April 1998, at 20.

<sup>13</sup> Comments of EMC Compliance, filed August 3, 1998.

<sup>14</sup> EMC Compliance indicates that one of the radios it tested was "a high quality 1960's vintage tube-based" radio. It says that another was "an early 1970's model." (EMC Compliance comments at 16.) Other than these two comments, it makes no reference to the age of the receivers tested.

Figure 19 from the EMC Compliance comments is reproduced here for illustrative purposes. We have added a line to this chart which illustrates the conducted emission limit (20  $\mu\text{V}$ ) that we concluded is necessary to protect AM radio receivers based on the test results provided in our comments.<sup>15</sup> Based on the EMC Compliance data, the limit we have proposed adequately would protect 27 of the 33 radios tested (82 percent) from AC power line conducted interference. Furthermore, the EMC Compliance data demonstrate that the existing FCC Class B conducted emissions limit provides adequate protection to only 3 of the 33 radios tested (9 percent).



**Figure 19:** TOI of AM radios with broadcast reception at  $10 \text{ dB} \frac{S+N}{N}$

Despite having derived its own test data which illustrates that existing FCC limits do not provide adequate protection to AM radio, EMC Compliance arrives at the inaccurate conclusion that “present day [conducted emissions] control has proved *sufficient* to protect AM band

<sup>15</sup> Comments of NAB, *supra*, at page 5.

receivers.”<sup>16</sup> The reason for this errant conclusion is EMC Compliance’s “normalization” of the conducted emission levels in its test results to a level of 48 dB $\mu$ V.<sup>17</sup> EMC Compliance recognized that its test results indicated that conducted emissions limits much more stringent than those now in existence are necessary. However, it surmised that because similar data must have been available when the Commission first adopted its 250  $\mu$ V limit, and since the Commission nevertheless adopted the 250  $\mu$ V limit, that all of the current test data derived by EMC Compliance should be “normalized” to this value.<sup>18</sup> This “normalization” of its data has led EMC Compliance to draw inaccurate conclusions about the impact of AC power line conducted emissions on AM radio reception.

The pre-normalized data provided by EMC Compliance shows, indisputably, that significantly tighter AC power line conducted emissions limits are necessary in order to protect AM receivers from harmful interference. This conclusion is backed up by the independently produced test results reported in our comments in this proceeding.

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<sup>16</sup> Comments of EMC Compliance, *supra*, at 23.

<sup>17</sup> *Id.* at 17.

<sup>18</sup> *Id.* at 17 and n.8.



## VII. CONCLUSION

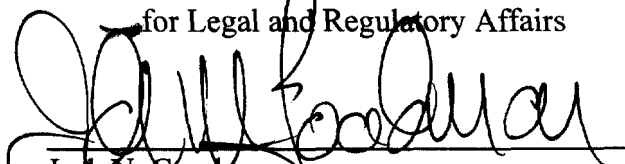
As explained in NAB's initial comments, rather than reducing regulatory oversight and affording less stringent conducted emission limits, the FCC should devise *more effective* and *more comprehensive* interference protection measures. We urge the Commission to institute rulemaking proceedings promptly that will yield a regulatory system providing the public with interference-free service from AM broadcast and other local broadcast operations.

**NATIONAL ASSOCIATION OF  
BROADCASTERS**

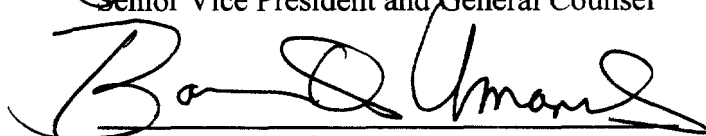
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